

Claims

- [c1] 1.A rotating machine comprising:
a vertically-mounted shaft supported in a main housing, said shaft being normally supported by bearings within said housing and said shaft having an upper end extending through an upper end of said main housing;
a shaft support for relieving said bearings of stress during periods of non use of said rotating machine, said shaft support providing an upward force on said shaft.
- [c2] 2.The rotating machine of Claim 1, wherein said rotating machine is a pump.
- [c3] 3.The rotating machine of Claim 1, wherein said shaft support comprises a pneumatic piston which converts fluid pressure into a force exerted upward against said upper end of said shaft.
- [c4] 4.The rotating machine of Claim 1, wherein said upper end of said shaft is threaded and said shaft support comprises a platform having an opening through which said upper end passes and a nut tightened over said upper end and onto said platform, said nut thereby imparting an upward force on said upper end of said shaft.
- [c5] 5.A pump comprising:
a pump housing, said pump housing being oriented vertically;

a shaft, said shaft being supported for rotation on bearings within said pump housing;
a shaft support for selectively relieving said bearings of stress during periods of non-use of said pump, said shaft support providing an upward force on said shaft.

- [c6] 6.The pump of Claim 5, wherein said shaft support provides an upward force on an upper end of said shaft.
- [c7] 7.The pump of Claim 6, wherein said upper end of said shaft extends through an upper end of said pump housing.
- [c8] 8.The pump of Claim 7, wherein said upper end of said shaft is threaded and said shaft support comprises a platform having a hole through which said upper end of said shaft passes and a nut tightened over said upper end of said shaft and onto said platform, said nut thereby imparting an upward force on said upper end of said shaft.
- [c9] 9.The pump of Claim 5, wherein said shaft support comprises a pneumatic piston which converts fluid pressure into a force exerted upward against an upper end of said shaft.
- [c10] 10.The pump of Claim 9, further comprising a control system, wherein the control system comprises a gas source in fluid communication with the pneumatic piston and an actuatable valve intermediate the gas source and the pneumatic piston.

[c11] 11. The pump of Claim 9, wherein said piston is coaxially disposed over said upper end of said shaft, said piston having a tubular stem extending therefrom, said tubular stem engaging said upper end of said shaft when a pressure space directly beneath said piston is pressurized relative to a pressure space over said piston, said piston and said stem thereby imparting an upward force against said upper end of said shaft.

[c12] 12. The pump of Claim 10, further comprising a vent in fluid communication with a space defined by a wall of the support system in contact with the pneumatic piston.

[c13] 13. A pump comprising:
a vertically oriented pressure pot having a cap secured thereto at an upper end of said pressure pot;
a pump housing suspended within said pressure pot from said cap;
a lateral support fixed to a lower end of said pressure pot, said lateral support interacting with an extension of said pump housing to prevent said pump housing from swinging laterally within said pressure pot.

[c14] 14. The pump of Claim 13, wherein said lateral support allows axial movement between said pump housing and said pressure pot.

[c15] 15.The pump of Claim 13, wherein said lateral support extends through said pressure pot and forms a second extension extending down from said pressure port, said second extension interacting with a third extension extending up from a solid surface beneath said pressure port, said second extension and said third extension cooperating to prevent lateral movement between said pressure port and said surface.

[c16] 16.The pump of Claim 15, wherein said second extension and said third extension of said lateral support allow relative axial movement between said pressure pot and said surface.

[c17] 17.The pump of Claim 15, wherein said lateral support includes a thermal block comprising a thermally insulative material to reduce thermal conduction between said surface and interior of said suction pot.

[c18] 18.A method of supporting a pump shaft during periods of non-operation of a pump, said method comprising: exerting an upward force against said shaft during said periods of non use thereby off-loading bearings normally supportive of said shaft.

[c19] 19.The method of Claim 18, wherein said step of exerting an upward force comprises charging a pressure space below a pneumatic piston with pressurized fluid.

[c20] 20.The method of Claim 18, wherein said step of exerting an upward force comprises tightening a nut over a threaded upper end of said shaft and against a platform supported above said pump.